Curriculum Vitae for Ryan Daniel Gold

Address:

Ryan Gold, Research Geologist, Mendenhall Fellow
Geologic Hazards Science Center / U.S. Geological Survey
1711 Illinois St
Golden, CO 80401

Email: rgold@usgs.gov
Mobile: 541-778-244
Office: 303-273-8633
Fax: 303-273-8600

Current Position:

Mendenhall Post Doctoral Research Fellow Oct. 2009 – present
Geologic Hazards Science Center / U.S. Geological Survey / Golden, CO
Project Description I am investigating active right-lateral deformation in the Northern Walker Lane along an east-northeast trending transect extending from the Mohawk Valley (California) in the west to Pyramid Lake (Nevada) in the east. Along this transect, I am evaluating the earthquake record of four en-echelon strike-slip faults to test the extent to which these structures are dynamically linked. In addition, I seek to resolve a factor of two discrepancy between the geodetically determined shear velocity (~8-9 mm/yr) and the sum of the geologically determined slip-rates (~3-5 mm/yr) in the region.

Education:

Ph.D., Structural Geology and Neotectonics Sept. 2009
University of California, Davis, CA
Thesis Title: "Latest Quaternary slip history along the central Altyn Tagh Fault, NW China, derived from faulted terrace risers"

M.S., Structural Geology and Neotectonics March 2006
University of California, Davis, CA
Thesis Title: "Application of trishear fault-propagation folding to active reverse faults: examples from the Dalong Fault, Gansu Province, NW China"

B.A., Geology (*summa cum laude* with Honors & Distinction) Sept. 2003
Whitman College, Walla Walla, WA
Thesis Title: "A comparative study of aerial photographs and LIDAR imagery for landslide detection in the Puget lowland, Washington"

Advisors:

Eric Cowgill (M.S./Ph.D.), University of California, Davis 2003-2009
Patrick Spencer and Robert Carson (B.A.), Whitman College 2000-2003

Published Papers:

Cowgill, E., **Gold, R.**, Xuanhua, C., Xiaofeng, W., Arrowsmith, J.R. & Southon, J. R. Resolving the slip-rate discrepancy along the longest active strike-slip fault in Tibet. *Geology*. v. 37, no. 7, p. 647-650, doi:10.1130/G25623A.1.

Gold, R., Cowgill, E., Arrowsmith, J. R., Gosse, J., Wang, X. & Chen, X., 2009, Riser diachroneity, lateral erosion, and uncertainty in rates of strike-slip faulting: A case study from Tuzidun along the Altyn Tagh Fault, NW China. *Journal of Geophysical Research, B, Solid Earth and Planets*. v. 114, B04401, doi:10.1029/2008JB005913.

Gold, R., Cowgill, E., Wang, X.F., and Chen, X., 2006, Application of trishear fault-propagation folding to active reverse faults: examples from the Dalong Fault, Gansu Province, NW China: *Journal of Structural Geology*, v. 28, p. 200-219.

Bernardin, T., Cowgill, E., **Gold, R.**, Hamann, B., Kreylos, O., and Schmitt, A., 2006, Interactive mapping on 3-D terrain models: *Geochemistry Geophysics Geosystems*, v. 7, doi:10.1029/2006GC001335.

Papers in Review:

Gold, R., Cowgill, E., Arrowsmith, J. R., Chen, X., Sharp, W. D., Cooper, K. M., and Wang, X. F. (reviewed; revised submission with editor), Late Quaternary slip rate for the central Altyn Tagh Fault, northwest Tibet,

derived from faulted terrace risers at Kelutelage, Yukuang, and Keke Qiapu: *Geological Society of America Bulletin*.

Gold, R., and Cowgill, E., in review, Derivation of fault-slip histories from dated and displaced landforms to test for secular variation in slip: *Earth and Planetary Science Letters*.

Papers in Preparation:

Gold, R., Cowgill, E., Arrowsmith, J.R., Friedrich, A., in preparation, Mid Holocene earthquake cluster along the central Altyn Tagh Fault, NW China resolved through integration of morphochronologic datasets: for submission to *Science*.

Non-Peer Reviewed Papers:

Gold, R., 2009, Slip history for the central Altyn Tagh Fault, NW China, derived from faulted terrace risers [Ph.D. Dissertation]: Davis, University of California, Davis.

Gold, R., 2006, Application of trishear fault-propagation folding to active reverse faults: examples from the Dalong Fault, Gansu Province, NW China [M.S. Thesis]: Davis, University of California, Davis, p. 106.

Gold, R., 2004, A comparative study of aerial photographs and LIDAR imagery for landslide detection in the Puget Lowland, Washington, Open File Report, Washington State Department of Natural Resources, Division of Geology and Earth Resources, p. 76.

Gold, R., 2003, A comparative study of aerial photographs and LIDAR imagery for landslide detection in the Puget lowland, Washington [B.A. Honors Thesis]: Walla Walla, Whitman College. p. 66.

Selected Abstracts:

Gold, R., Cowgill, E., Arrowsmith, J. R., Chen, X., Sharp, W. D., Cooper, K. M., and Wang, X. F., 2009, Latest Quaternary slip history for the central Altyn Tagh Fault, NW China, derived from faulted terrace risers, Eos, Transaction, Volume 90: San Francisco, *American Geophysical Union*.

Gold, R., Cowgill, E., 2009, Derivation of "deep-time" fault-slip histories to test for secular variation in slip from dated and displaced landforms: Portland, OR. *Geological Society of America Abstracts with Programs*, v 41.

Gold, R., Cowgill, E., Arrowsmith, J.R., Gosse, J., Xuanhua, C., and Xiaofeng, W., 2008, Riser diachroneity, lateral erosion, and uncertainty in rates of strike-slip faulting: A case study from Tuzidun along the Altyn Tagh Fault, NW China, Joint Meeting of the Geological Society of America: Houston, TX. *Geological Society of America Abstracts with Programs*, v 40, p. 290.

Gold, R., Cowgill, E., Arrowsmith, J. R., Muretta, M., Gosse, J., Chen, X. & Wang, X., 2007. Holocene slip rate for the central Altyn Tagh Fault: Preliminary results from the Tuzidun site based on ^{14}C and ^{10}Be dating of a displaced fluvial terrace riser. Eos, Transaction, Volume 88: San Francisco, *American Geophysical Union*.

Gold, P., **Gold, R**., Cowgill, E., Kreylos, O., and Hamann, B., 2007, Efficient, Off-Grid LiDAR Scanning of Remote Field Sites, Eos, Transaction, Volume 88: San Francisco, *American Geophysical Union*.

Gold, R., Cowgill, E., Chen, X., and Wang, X., 2006, Holocene slip rate for the central Altyn Tagh Fault: Preliminary results from the Yue Ma Ke Qi site using displaced fluvial risers and ^{14}C geochronology, Eos, Transaction, Volume 87: San Francisco, *American Geophysical Union*.

Gold, R., Cowgill, E., Wang, X.-F., and Chen, X., 2006, Rate of active shortening across the Aksai restraining stepover along the Altyn Tagh Fault, Gansu Province, NW China, Abstracts with Programs, *Geological Society of America Abstracts with Programs*, v. 38 ,p. 239.

Gold, R., Cowgill, E., Wang, X.F., and Chen, X., 2004, Strike-slip fault evolution at intermediate (10 ka - 1 Ma) timescales: an example from the Aksai restraining stepover along the Altyn Tagh fault, NW China, Eos, Transactions, Volume 85: San Francisco, *American Geophysical Union*.

Gold, R., Wegmann, K., Palmer, S., Carson, R., and Spencer, P., 2003, A comparative study of aerial photographs and LIDAR imagery for landslide detection in the Puget Lowland, Washington: *Geological Society of America Abstracts with Programs*, v. 35, p. 12.

Invited Talks:

May 2010 The January 12, 2010 Haiti Earthquake: Deformation and Quaternary Faulting (co-presenter; U.S. Geological Survey, Golden, CO)

October 2009 Derivation of fault-slip histories from dated and displaced landforms to test for secular variation in slip: an example from the Altyn Tagh Fault, NW China (Dalhousie University, Halifax, Canada)

May 2009	Reconstructing the late Quaternary slip history of the central Altyn Tagh Fault (NW Tibet) from faulted terrace risers (U.S. Geological Survey, Menlo Park, CA)
April 2009	Late Quaternary slip history of the central Altyn Tagh Fault, NW China (U.S. Geological Survey, Golden, CO)
February 2009	Is the Holocene slip rate along the Altyn Tagh Fault 10 mm/yr, 30 mm/yr, or both? (Berkeley Geochronology Center, Berkeley, CA)
January 2009	Does the Altyn Tagh Fault show evidence for secularly or temporally varying slip-rate? (ExxonMobil, Houston, TX)
December 2008	Resolving the Holocene slip-history along the central Altyn Tagh Fault. (California State University, Sacramento).
March 2007	Is the Holocene slip rate along the Altyn Tagh Fault 10 mm/yr, 30 mm/yr, or both? New data from the Tuzidun site along the central Altyn Tagh Fault, NW China (Ludwig-Maximilians-Universität, München, Germany)
February 2007	What is the slip rate along the longest strike slip fault in the Indo-Asian collision? (Münster University, Münster, Germany)

Awards/Honors:

UC Davis Allen G. Marr Prize for the best dissertation	2010
Outstanding Student Paper Award at American Geophysical Union Fall Meeting (Tectonophysics)	2009
University of California, Davis Math and Physical Science Dean's Graduate Student Prize	2007
Outstanding Student Paper Award at American Geophysical Union Fall Meeting (Geodesy)	2004
Phi Beta Kappa Honors Society	2003
Top Student Presenter Award (oral) at Geological Society of America Meeting	2003
Whitman College Leeds Prize in Geology	2002
Valedictorian of Phoenix High School Senior Class	1999

Grants:

German Academic Exchange Service (DAAD) Research Grant	2009
Geological Society of America Travel Grant	2008
University of California, Davis Durrell Funds	2008-2009
Phi Beta Kappa Northern California Chapter Graduate Research Award	2007-2008
George & Dorthy Zolk Graduate Fellowship	2007-2008
University of California, Davis Graduate Research and Humanities Research Grant	2007-2008
Geological Society of America Graduate Student Research Grant	2006-2007
University of California, Davis and Humanities Graduate Research Award	2006-2007
University of California, Davis Thomas W. Todd Scholarship	2006-2007
University of California, Davis Thomas W. Todd Scholarship	2005-2006
University of California, Davis and Humanities Graduate Research Award	2004-2005
University of California, Davis Durrell Funds	2004-2005
American Association of Petroleum Geologists Grants-in-Aid	2004-2005

Service:

Geological Society of America Technical Session Co-Convener "Distributed Continental Shear Styles, Rates, and Variations in the Characteristics of Dextral Deformation along the Walker Lane and Eastern California Shear Zone"	2010
Mentor to undergraduate student, Peter Gold, in preparation for AGU 2007 meeting	2007-2008
Graduate student representative to the UC Davis Geology Faculty	2007-2008
University of California, Davis Geology Department Wednesday Seminar Co-Coordinator	2007-2008
American Geophysical Union Technical Session Co-Convener "From Displacements and Dates to Rates: How Do We Measure Fault- Slip Histories at Timescales of 1 kyr to 1 Myr?"	2006

Scientific Collaborations:

Jose Luis Antinao (Desert Research Institute, Reno, NV)	2010-present
Warren Sharp (Berkeley Geochronology Center, Berkeley, CA)	2008-present
Anke Friedrich (Ludwig-Maximilians-Universität, München, Germany)	2007-present
Kari Cooper (University of California, Davis, CA)	2007-present

John Gosse (Dalhousie University, Cosmogenic Nuclide Exposure Dating Facility, Halifax, CN) 2006-present
John Southon (University of California, Irvine, KCCAMS, CA) 2005-present
J Ramón Arrowsmith (Arizona State University, Tempe, AZ) 2005-present
Wang Xiao-Feng and Chen Xuanhua (Institute of Geomechanics, Beijing) 2004-present

Foreign Language Skills:

German • Goethe Institute (level A1); University of California, Davis (1 year), 11 months immersion in Germany
Chinese • 11 months immersion in the P.R. of China
Spanish • 4 ½ years high school course work

Geological Employment History:

Graduate Student Researcher / Teaching Assistant 2003 – 2009
University of California, Davis
One Shields Ave, Davis, California 95616
Responsibilities: Conducted field work in remote western China related to M.S. and Ph.D. research. Executed associated laboratory analyses. Prepared results for professional presentation and publication. Courses taught included: GEL001 "The Earth"; GEL101L "Earth Dynamics II Laboratory"; GEL103 "Field Geology"; GEL110 "Summer Field"

Independent geohazard researcher summer 2002
Geology and Earth Resources, Geologic Hazards
Department of Natural Resources, Olympia, Washington, 98504
Responsibilities: Executed an independent research project to test the quality and quantity of landslide identification between conventional photogrammetry and newer LiDAR datasets for an eight-kilometer stretch of heavily forested. landslide-prone coast along Hood Canal, Kitsap County, Washington. The data collected served as the core of my Honors B.A. thesis. I synthesized the results, presented my findings, and prepared them for publication.

Geotechnician summer 2000
Zipper Zeman Associates Inc.
Lynnwood, Washington, 98036
Responsibilities: Conducted grain-size analyses, soil compaction tests, Atterberg limit tests, and water content tests. Prepared technical reports for clients. Excavated and logged soil pits, conducted fluid flow tests, and made general site evaluations including reconnoitering and investigation.

Geoscience Skills and Experience:

Field Work	•Lead or co-lead four field seasons (2-3 months) to China (Xinjiang, Gansu, Qinghai, Tibet) •Initiated pilot field work (3 weeks) in the Northern Walker Lane (California/Nevada) •Post-earthquake response (1 week) following 2010 January along Enriquillo Fault (Haiti) •Responsibilities—undertook research, maintained research equipment, managed personal (2-4 Americans, 1 Chinese collaborator, 2-4 Chinese drivers), gear, food, camping equipment
Mapping	•Structural mapping of deformed crystalline, metamorphic, and sedimentary units in thrust, reverse, and strike-slip fault settings. •Neotectonic mapping of deformed fluvial, alluvial, and glacial markers in strike-slip and reverse fault settings. •Base maps – topographic (1:100,000, 1:24,000), satellite (Landsat, CORONA, Quickbird), and stereo aerial photographs
Total Station	•Equipment – Leica407power total station •Applications – neotectonic mapping, topographic surveys, and profile surveys •Software – Microsurvey Field Genius, Microsurvey CAD
T-LiDAR	•Purchasing – Researched, tested, and guided purchasing of Terrestrial Light Distance and Ranging (T-LiDAR) unit for University of California, Davis Geology Department •Equipment – Trimble GX DR200+ 3D Scanner •Software – PointScape version 3.1., RealWorks Survey version 6.1.2 •Applications – Point cloud surveys of faulted fluvial landforms •Data processing – Point cloud registration, point cloud quality control, interpolation of point cloud data to generate gridded topographic models (DEMS), visualization of point cloud data in Keck CAVE immersive visualization center
GPS	•Purchasing – Researched, tested, and guided purchasing of Real Time Kinematic GPS unit for University of California, Davis Geology Department •Equipment – Trimble R7 RTK GPS Rover/Base system
Trenching	•Excavations into fluvial deposits to characterize stratigraphy and to collect samples for radiocarbon, in-situ cosmogenic radionuclide, luminescence, and pedogenic carbonate U-series geochronology
Laboratory	•Radiocarbon – processed and analyzed ~180 ^{14}C samples (UC Irvine KCCAMS laboratory) •In-situ cosmogenic radionuclide dating – processed and analyzed ~25 ^{10}Be samples (Dalhousie University CNEF Laboratory) and conducted related data reduction. •U-series – pilot pedogenic carbonate U-series dating project – processed and analyzed 9 samples (University of California, Davis and Berkeley Geochronology Center)
GIS	•Software packages – ArcGIS, ENVI, Erdas •Extensions – 3D Analyst, Spatial Analyst, ArcHydro •Applications – Topographic relief analysis, interpolation of surfaces (Kriging, Inverse Distance Weighted, Spline), rectification of satellite imagery, drainage analysis
Software	•Matlab – Scarp diffusion modeling, topographic profile generation •Adobe Illustrator/Photoshop – Figure drafting, poster preparation, digital image preparation •Office Suite (Excel, Word, Powerpoint) – Manuscript preparation, professional presentations